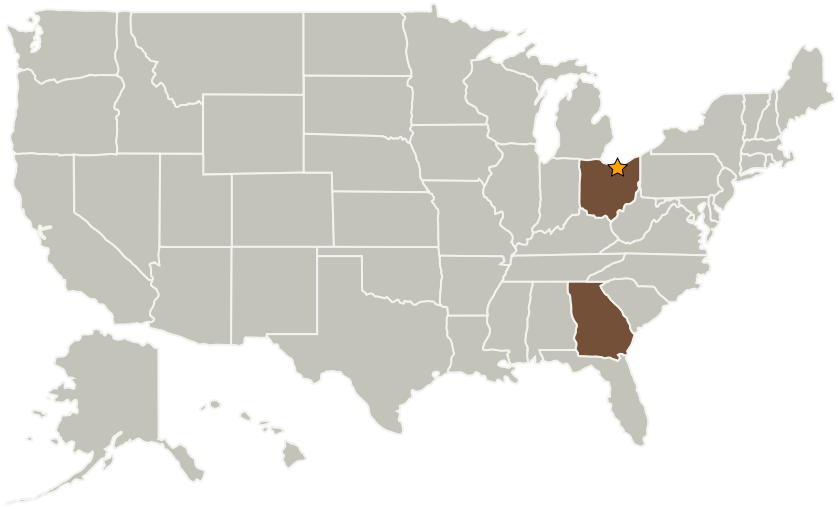
Smart Multifunction Antenna for Lunar/Planetary Surface Network, Phase I

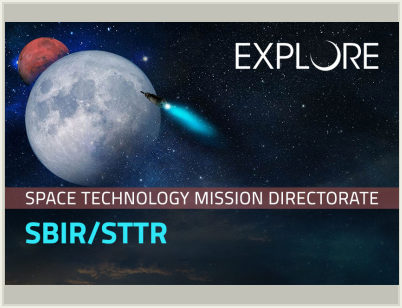
Completed Technology Project (2007 - 2007)

Project Introduction

NASA is planning a series of human and robotic missions to explore the Moon and later Mars. According to NASA SBIR topic O1.10, surface networks are needed for these missions. In particular, for surface networks, NASA needs reconfigurable, directionally selectable, steerable, multi-frequency switched patch or multiple-input multiple-output (MIMO) antenna arrays to be mounted on human helmets, robots, and fixed structures (e.g. habitats). These antennas must meet the specific performance requirements for lunar/planetary surface network and the demanding transport and operational space environments. Wang Electro-Opto Corporation (WEO) proposes an SBIR Phase-1 program to develop a "Smart Multifunction Antenna for Lunar/Planetary Surface Network." Two general design approaches will be investigated initially: beamsteering array and MIMO (multiple-input multiple-output) array. The technical approach will leverage WEO's existing well-published smart, multifunction, broadband, conformal and low-profile antennas developed for DoD (Department of Defense) terrestrial applications. The proposed Phase 1 research will aim at demonstrating, by breadboard experiments, the feasibility of the technical approach in meeting NASA's specific operational requirements, the constraints of space mission environment, and the limited room on astronauts and robots, fixed nodes, and other platforms. WEO will select the more promising one of these two approaches, based on performance criteria and other NASA inputs, for possible brassboard development in Phase 2.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Wang Electro-Opto Corporation	Supporting Organization	Industry	Marietta, Georgia

Primary U.S. Work Locations	
Georgia	Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.2 Radio Frequency
    - TX05.2.6 Innovative Antennas